

CLAIM LISTING

Please find below a complete listing of presently pending claims with status identifiers. This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A medical probe device comprising:
 - an ultrasound transducer assembly, said assembly including a housing having a base and defining a probe guide opening therethrough, said housing receiving a transducer therewithin; and
 - a sterilizable seal removably co-operable with said transducer assembly, said seal including a probe guide for receipt in said probe guide opening, and said seal ~~including a sleeve adapted to enclose at least that portion of said housing that defines said probe guide opening~~ cooperate with said housing to define a sterile barrier ~~between said housing and an external field~~, said seal when in cooperation with said housing providing said probe guide within said probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough; and
 - a clamp being adapted to secure a probe in said probe guide at a predetermined position.
 2. Cancelled.
 3. (Currently Amended) The medical probe device of claim 1, wherein the sleeve seal comprises a pliant material.
 4. (Currently Amended) The medical probe device of claim 1, wherein the sleeve seal comprises a non-pliable first piece and a non-pliable second piece removably attachable to one another.
 5. (Previously Presented) The medical probe device of claim 1, wherein the ultrasound transducer is a linear ultrasound transducer and the ultrasound transducer housing is non-invasive.
 6. (Original) The medical probe device of claim 5, wherein the probe guide opening is perpendicular to the base of the ultrasound transducer housing.

7. (Previously Presented) The medical probe device of claim 1, wherein the ultrasound transducer defines an arcuate profile and the ultrasound transducer housing is non-invasive.

8. (Original) The medical probe device of claim 7, wherein the probe guide opening is perpendicular to the tangent of the base at the probe guide opening.

9. Cancelled.

10. (Previously Presented) The medical probe device of claim 1, wherein the ultrasound transducer is connectable to a monitor for displaying a sonogram.

11. (Previously Presented) The medical probe device of claim 10, wherein the path of a probe guided through the probe guide defines a line that is parallel to the plane of the sonogram.

12. (Currently Amended) The medical probe device of claim 10, further comprising a detector for detecting motion of a probe ~~in~~ within the probe guide, the detector being in communication with a processing unit for displaying information concerning the motion of a probe in the ~~sterile~~ probe guide.

13. (Previously Presented) The medical probe device of claim 12, wherein the information is displayed as a computer generated image of a virtual probe on the monitor.

14-27. Cancelled.

28. (Currently Amended) A sterilizable seal for use in a medical procedure, said seal comprising a probe guide for receipt of a probe therethrough, said probe guide being adapted for receipt in a probe guide opening defined by an ultrasound transducer housing such that in cross section said probe guide opening completely surrounds said probe guide along at least a portion of the length of said probe guide opening, said probe guide providing an unimpeded passageway through said seal, said seal being adapted to enclose at least that portion of said housing that defines said probe guide opening ~~further comprising a sleeve for substantially enclosing said transducer housing to define a sterile barrier between said housing and an external field~~.

29. Cancelled.

30. (Currently Amended) The sterilizable seal of claim 28, wherein at least a portion of the sterilizable sleeve seal is formed of a pliant material.

31. (Currently Amended) The sterilizable seal of claim 28, further comprising a base[.] adapted to conform to the base of ~~an~~ the ultrasound transducer housing.

32. Cancelled.

33. (Previously Presented) The sterilizable seal of claim 28, wherein the probe guide comprises top and bottom portions removably attachable to one another.

34-41. Cancelled.

42. (Currently Amended) A method for guiding a percutaneous probe to a percutaneous target comprising:

providing an ultrasound transducer assembly, said assembly including an ultrasound transducer for transmitting an ultrasonic beam and receiving reflections of the ultrasonic beam, the ultrasound transducer assembly further including a housing defining a probe guide opening therethrough;

providing a sterile seal about said transducer assembly, the sterile seal comprising a probe guide for receipt in said probe guide opening and a sleeve said seal being adapted to cooperate with said housing;

attaching the sterile seal to the ultrasound transducer assembly with the probe guide being received in the probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough, the sleeve seal in cooperation with the ultrasound transducer housing enclosing at least that portion of said housing that defines said probe guide opening defining a sterile barrier between the ultrasound transducer housing and an external field;

guiding a probe through the probe guide to a predetermined percutaneous location; and

clamping the probe in the probe guide when the probe is at [[a]] the predetermined desired location.

43. (Previously Presented) The method of claim 42, further comprising forming a sonogram of the percutaneous location on a monitor in response to the reflections of the ultrasonic beam.

44. (Previously Presented) The method of claim 43, wherein the path of the probe guided through the probe guide defines a line that is parallel to the plane of the sonogram.

45. (Previously Presented) The method of claim 44, further comprising forming a virtual indication of the location of the probe on the sonogram.

46. (Original) The method of claim 43, further comprising:
creating a data stream in response to motion of the probe in the probe guide; and

forming a real time image of information contained in the data stream.

47. (Previously Presented) The method of claim 46, wherein the real time image is an image of a virtual probe overlaid on the sonogram.

48. Cancelled.

49. (Previously Presented) The method of claim 42, wherein the percutaneous location is the lumen of a blood vessel.

50. (Original) The method of claim 42, wherein the method is carried out by a single operator.

51. Cancelled.

52. (Currently Amended) A method of guiding a probe to a percutaneous location comprising:

providing an ultrasound transducer assembly, said assembly including an ultrasound transducer for transmitting an ultrasonic beam in a field and receiving reflections of the ultrasonic beam, the ultrasound transducer assembly further including a housing defining a probe guide opening therethrough;

guiding a probe through the probe guide opening and into the field of the ultrasonic beam;

forming a sonogram in response to the reflections received by the ultrasound transducer;

detecting the motion of the probe within in the probe guide opening;

creating a data stream in response to the detected motion of the probe;

forming a real time virtual image of the location of the probe that is in the field of the ultrasonic beam, wherein the probe image is formed on the sonogram from the information contained in the data stream.

53. (Original) The method of claim 52, wherein the motion of the probe in the probe guide defines a line that is parallel to the plane of the sonogram.

54. (Previously Presented) The method of claim 52, further comprising clamping the probe in the probe guide.

55. Cancelled.

56. (Previously Presented) The medical probe device of claim 1, wherein the clamp is an integral part of the sterilizable seal.

57. (Previously Presented) The sterilizable seal of claim 28, further comprising a clamp associated with the probe guide for selective securement of a probe at a predetermined location within said probe guide.

58. (Currently Amended) The sterilizable seal of claim 28, wherein the sleeve is formed of seal comprises a non-pliable first portion and a non-pliable second portion removable attachable to one another, one portion of the sleeve being continuous from one end of the probe guide.

59. (Currently Amended) The method according to claim 52, further comprising:

providing a sterile seal about said transducer assembly, the seal comprising a probe guide for receipt into said probe guide opening, a sleeve the seal being adapted to cooperate with said housing, and a clamp;

attaching the sterile seal to the ultrasound transducer assembly with the probe guide being received in the probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough, the seal enclosing at least that portion of said housing that defines said probe guide opening sleeve at least substantially enclosing the ultrasound transducer housing and defining a sterile barrier between the ultrasound transducer housing and an external field.

60. (Currently Amended) The method of claim 59, in which the motion of the probe ~~in~~ within the probe guide opening is detected by a motion detector located on the sterile seal.

61. (Currently Amended) The method of claim 52, in which the motion of the probe ~~in~~ within the probe guide opening is detected with a motion detector that is integral to the ultrasound transducer housing.

62. (Currently Amended) A medical probe device comprising:

an ultrasound transducer assembly, said assembly including a housing defining a probe guide opening therethrough, said housing receiving a transducer therewithin;

a sterilizable seal removably co-operable with said transducer assembly, said seal including a probe guide for receipt into said probe guide opening, and said seal ~~including a sleeve adapted to enclose at least that portion of said housing that defines said probe guide opening cooperate with said housing to define a sterile barrier between said housing and an external field~~, said seal when in cooperation with said housing providing said probe guide within said probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough; and

a motion detector for detecting motion of a probe within ~~in~~ the probe guide.

63. (Previously Presented) The medical probe device of claim 62, in which the motion detector is incorporated into the sterilizable seal.

64. (Previously Presented) The medical probe device of claim 62, in which the motion detector is integral to the ultrasound transducer assembly.

65. (Currently Amended) The medical probe device of claim 62 wherein the sleeve seal comprises a pliant material.

66. (Currently Amended) The medical probe device of claim 62, wherein the sleeve seal comprises a non-pliable first piece and a non-pliable second piece removably attachable to one another.

67. (Previously Presented) The medical probe device of claim 62, wherein the ultrasound transducer is a linear transducer and the ultrasound transducer housing is noninvasive.

68. (Previously Presented) The medical probe device of claim 62, wherein the ultrasound transducer defines an arcuate profile and the ultrasound transducer housing is noninvasive.

69. (Previously Presented) The medical probe device of claim 62, wherein the ultrasound transducer is connectable to a monitor for displaying a sonogram and the motion detector is connectable to the monitor for displaying a computer generated image of a probe.

70. (Currently Amended) A medical probe device comprising:

an ultrasound transducer assembly, said assembly including a housing defining a probe guide opening therethrough, said housing receiving a transducer therewithin;

a sterilizable seal removably co-operable with said transducer assembly, said seal including a probe guide for receipt into said probe guide opening, said seal ~~including a sleeve adapted to enclose at least that portion of said housing that defines said probe guide opening~~ cooperate with said housing to define a sterile barrier between said housing and an external field, said seal including a clamp for securing a probe in said probe guide, said seal when in cooperation with said housing providing said probe guide within said probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough; and

a motion detector for detecting motion of a probe within in the probe guide.

71. (Previously Presented) The medical probe device of claim 70, in which the motion detector is located on the sterilizable seal.

72. (Previously Presented) The medical probe device of claim 70, in which the motion detector is integral to the ultrasound transducer housing.

73. (Currently Amended) The medical probe device of claim 70, wherein the sleeve seal comprises a pliant material.

74. (Currently Amended) The medical probe device of claim 70, wherein the sleeve seal comprises a non-pliable first piece and a non-pliable second piece removably attachable to one another.

75. (Previously Presented) The medical probe device of claim 70, wherein the ultrasound transducer is connectable to a monitor for displaying a sonogram and the motion detector is connectable to the monitor for displaying a computer generated image of a probe.

76. (Currently Amended) A method for guiding a percutaneous probe to percutaneous location comprising:

providing an ultrasound transducer assembly, said assembly including an ultrasound transducer for transmitting an ultrasonic beam and receiving reflections of the ultrasonic beam, said ultrasound transducer assembly further including a housing defining a probe guide opening therethrough;

providing a sterile seal about said transducer assembly, the seal comprising a probe guide for receipt into said probe guide opening, a sleeve the seal being adapted to cooperate with said housing, and a clamp;

attaching the sterile seal to the ultrasound transducer assembly with the probe guide being received in the probe guide opening and providing an unimpeded passageway through said seal for passage of a probe therethrough, and such that said seal encloses at least that portion of said housing that defines said probe guide opening and the sleeve defining a sterile barrier between the ultrasound transducer housing and an external field;

guiding a probe through the probe guide and into the field of the ultrasonic beam such that the tip of the probe approaches a predetermined percutaneous location;

forming a sonogram in response to the reflections received by the ultrasound transducer;

detecting the motion of the probe within in the probe guide opening;

creating a data stream in response to the detected motion;

forming a real time virtual image of the probe that is in the field of the ultrasonic beam, wherein the probe image is formed on the sonogram from the information contained in the data stream; and

securing the probe in the probe guide by use of the clamp.